

Docket No. AB-147U

Amendments to and Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (canceled)

Claim 2 (currently amended): ~~The method of Claim 1~~ A method of modulating pancreatic endocrine secretions of a patient, comprising:

implanting at least one system control unit in the body of a patient, wherein the at least one unit controls the delivery of at least one stimulus to at least one type of pancreatic cell affecting pancreatic endocrine secretions; and

applying the at least one stimulus to the at least one type of pancreatic cell in order to hyperpolarize the at least one type of pancreatic cell and thereby modulate at least one pancreatic endocrine secretion;

wherein the at least one type of pancreatic cell is an alpha cell and wherein the hyperpolarization inhibits secretion of glucagon.

Claim 3 (currently amended): ~~The method of Claim 1~~ A method of modulating pancreatic endocrine secretions of a patient, comprising:

implanting at least one system control unit in the body of a patient, wherein the at least one unit controls the delivery of at least one stimulus to at least one type of pancreatic cell affecting pancreatic endocrine secretions; and

applying the at least one stimulus to the at least one type of pancreatic cell in order to hyperpolarize the at least one type of pancreatic cell and thereby modulate at least one pancreatic endocrine secretion;

wherein the at least one type of pancreatic cell is a delta cell and wherein the hyperpolarization inhibits secretion of somatostatin.

Claim 4 (canceled)

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Claim 5 (original): A method of modulating pancreatic endocrine secretions of a patient, comprising:

Implanting at least one system control unit in the body of a patient, wherein the at least one unit controls the delivery of at least one stimulus to at least one type of pancreatic cell affecting pancreatic endocrine secretions; and

applying the at least one stimulus to the at least one type of pancreatic cell in order to depolarize the at least one type of pancreatic cell to thereby increase secretion of a substance that inhibits insulin secretion.

Claim 6 (original): The method of Claim 5 wherein the at least one type of pancreatic cell is an alpha cell and wherein the depolarization increases secretion of glucagon.

Claim 7 (original): The method of Claim 5 wherein the at least one type of pancreatic cell is a delta cell and wherein the depolarization increases secretion of somatostatin.

Claim 8 (original): A method of modulating pancreatic endocrine secretions of a patient, comprising:

implanting at least one system control unit in the body of a patient, wherein the at least one unit controls the delivery of stimulation to at least one parasympathetic tissue innervating the pancreas; and

applying the stimulation to the at least one parasympathetic tissue in order to minimize stimulation of gastrointestinal structures and the heart while maximizing stimulation of pancreatic beta cells, whereby insulin secretion is modulated.

Claim 9 (original): The method of Claim 8 wherein the stimulation is applied to at least one of the posterior gastric, anterior gastric, celiac, and hepatic branches of the vagus nerve.

Claim 10 (original): The method of Claim 8 further comprising applying the stimulation to the at least one parasympathetic tissue in order to increase insulin secretion.

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Claim 11 (original): The method of Claim 10 wherein the at least one system control unit is connected to at least two electrodes, and wherein the stimulation is electrical stimulation applied via the at least two electrodes at a frequency of about 3-12 Hz.

Claim 12 (original): The method of Claim 8 further comprising applying the stimulation to the at least one parasympathetic tissue in order to decrease insulin secretion.

Claim 13 (currently amended): The method of Claim 12 wherein the at least one system control unit is connected to at least two electrodes, and wherein the stimulation is electrical stimulation applied via the at least two electrodes at a frequency of greater than about 50[[-100]] Hz.

Claim 14 (original): The method of Claim 12 wherein the stimulation is drug stimulation and wherein at least one of a cholinceptor-blocking medication and an autonomic ganglion-blocking medication is applied to the parasympathetic tissue.

Claim 15 (canceled)

Claim 16 (currently amended): The method of ~~Claim 15~~ Claim 17 further comprising sensing a condition and using the sensed condition to automatically determine the stimulation to apply.

Claim 17 (currently amended): ~~The method of Claim 15~~ A method of modulating pancreatic endocrine secretions of a patient, comprising:

implanting at least one system control unit in the body of a patient, wherein the at least one unit controls the delivery of stimulation to at least one sympathetic tissue innervating the pancreas; and

applying the stimulation to the at least one sympathetic tissue in order to modulate at least one pancreatic endocrine secretion;

wherein the at least one sympathetic tissue is at least one of the ganglia of the paraspinal sympathetic trunks, celiac ganglia, aorticorenal ganglia, super mesenteric ganglion, inferior mesenteric ganglion, phrenic ganglion, left greater splanchnic nerve, left lesser

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splanchnic nerve, left least splanchnic nerve, right greater splanchnic nerve, right lesser splanchnic nerve, and right least splanchnic nerve.

Claim 18 (original): The method of Claim 17 wherein the stimulation inhibits sympathetic input to the pancreas, whereby glucagon secretion is reduced.

Claim 19 (currently amended): The method of Claim 18 wherein the at least one system control unit is connected to at least two electrodes, and wherein the stimulation is electrical stimulation delivered via the at least two electrodes at a frequency of greater than about 50[[-100]] Hz.

Claim 20 (original): The method of Claim 18 wherein the stimulation is drug stimulation and wherein at least one of an adrenoceptor antagonist medication and an autonomic ganglion-blocking medication is applied to the sympathetic tissue.

Claim 21 (original): The method of Claim 17 wherein the stimulation excites sympathetic input to the pancreas, whereby glucagon secretion is increased.

Claim 22 (currently amended): The method of Claim 21 wherein the at least one system control unit is connected to at least two electrodes, and wherein the stimulation is electrical stimulation delivered via the at least two electrodes at a frequency of less than about [[50-]]100 Hz.

Claim 23 (original): The method of Claim 21 wherein the stimulation is drug stimulation and wherein at least one of an adrenoceptor-activating medication and a sympathomimetic medication is applied to the sympathetic tissue.

Claim 24 (canceled)

Claim 25 (currently amended): The method of ~~Claim 24~~ Claim 26 further comprising sensing a condition and using the sensed condition to automatically determine the stimulation to apply.

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Claim 26 (currently amended): ~~The method of Claim 24~~ A method of modulating pancreatic endocrine secretions of a patient, comprising:

implanting at least one system control unit in the body of a patient, wherein the at least one unit controls the delivery of drug stimulation to at least one area affecting pancreatic endocrine secretions; and

applying the drug stimulation to the at least one area in order to modulate at least one pancreatic endocrine secretion;

wherein the at least one system control unit is connected to at least one catheter, and wherein the stimulating drug is applied via the at least one catheter to at least one pancreatic islet or graft to increase insulin secretion, and wherein the drug is at least one of glucose, K⁺, Ca⁺⁺, arginine, lysine, acetylcholine, a cholinergic agonist, a beta-adrenergic agonist, an alpha-adrenergic antagonist, glucagon, glucagon-like peptide 1, gastric inhibitory peptide, secretin, cholecystokinin, and a beta-3-agonist.

Claim 27 (currently amended): ~~The method of Claim 24~~ A method of modulating pancreatic endocrine secretions of a patient, comprising:

implanting at least one system control unit in the body of a patient, wherein the at least one unit controls the delivery of drug stimulation to at least one area affecting pancreatic endocrine secretions; and

applying the drug stimulation to the at least one area in order to modulate at least one pancreatic endocrine secretion;

wherein the at least one system control unit is connected to at least one catheter, and wherein the stimulating drug is applied via the at least one catheter to at least one pancreatic islet or graft to inhibit insulin secretion, and wherein the drug is at least one of an alpha-adrenergic agonist, a cholinergic antagonist, a beta-adrenergic antagonist, somatostatin, galanin, pancreastatin, and leptin.

Claim 28 (currently amended): ~~The method of Claim 24~~ A method of modulating pancreatic endocrine secretions of a patient, comprising:

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implanting at least one system control unit in the body of a patient, wherein the at least one unit controls the delivery of drug stimulation to at least one area affecting pancreatic endocrine secretions; and

applying the drug stimulation to the at least one area in order to modulate at least one pancreatic endocrine secretion;

wherein the at least one system control unit is connected to at least one catheter, and wherein the stimulating drug is applied via the at least one catheter to at least one pancreatic islet or graft to increase glucagon secretion, and wherein the drug is at least one of an alpha-adrenergic agonist, arginine, and alanine.

Claim 29 (currently amended): ~~The method of Claim 24~~ A method of modulating pancreatic endocrine secretions of a patient, comprising:

implanting at least one system control unit in the body of a patient, wherein the at least one unit controls the delivery of drug stimulation to at least one area affecting pancreatic endocrine secretions; and

applying the drug stimulation to the at least one area in order to modulate at least one pancreatic endocrine secretion;

wherein the at least one system control unit is connected to at least one catheter, and wherein the stimulating drug is applied via the at least one catheter to at least one pancreatic islet or graft to inhibit glucagon secretion, and wherein the drug is at least one of an alpha-adrenergic antagonist, glucose, and insulin, ~~and somatostatin~~.

Claim 30 (new): The method of Claim 27 further comprising sensing a condition and using the sensed condition to automatically determine the stimulation to apply.

Claim 31 (new): The method of Claim 28 further comprising sensing a condition and using the sensed condition to automatically determine the stimulation to apply.

Claim 32 (new): The method of Claim 29 further comprising sensing a condition and using the sensed condition to automatically determine the stimulation to apply.